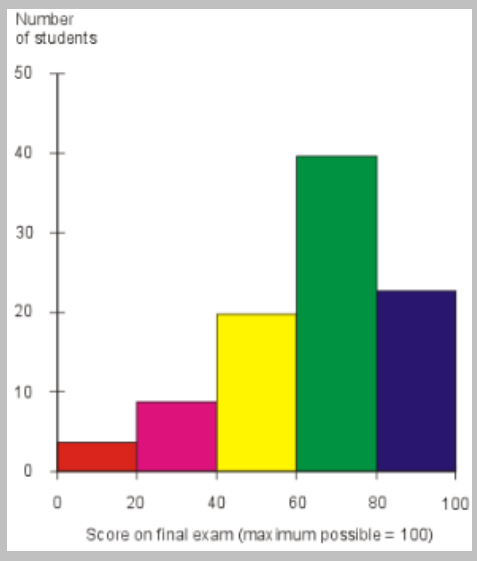
1.3 Histograms

Histograms = shows the frequency of values in a set of numerical data. They help us to see the distribution of data.

- Not a bar chart as they use bins and a bar chart can use non numerical data.

Vertical Axis = shows the frequency of the data within each bin.

Horizontal Axis = data values grouped into bins.



How to form one:

The following is the OHS girl's basketball team's points scored in 28 games from last season:

32	32	36	37	37	38	43	44	46	49	52	55	55	56
58	59	61	61	62	62	63	70	72	73	77	82	84	86

1) A bin size is chosen; however you should limit to only 6 or 7 bins.
** often is given to you **

A bin size of 10

vertical axis

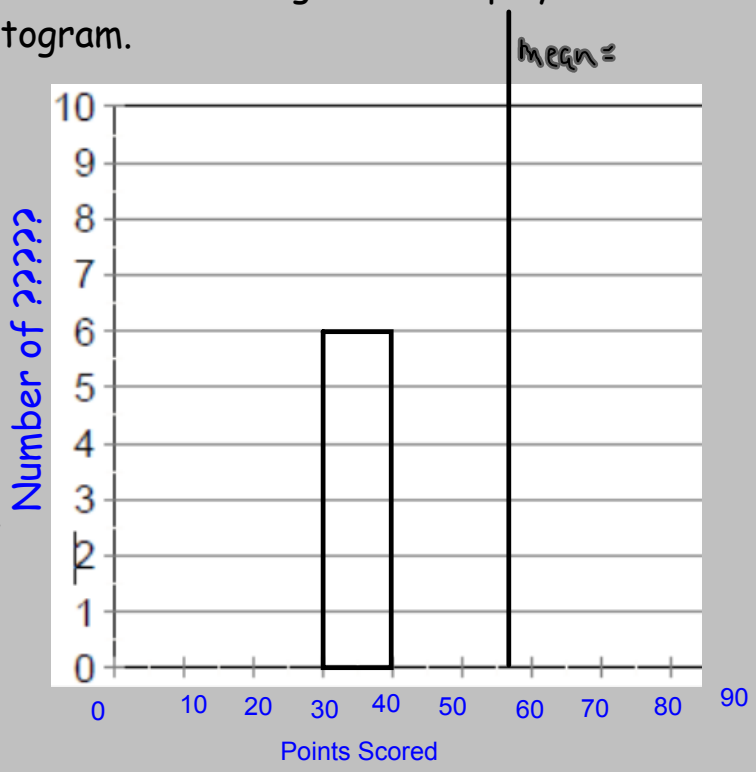
2) A frequency table is created:

**** The bin 30 - 40 includes values that are 30 or greater but less than 40, etc.****

Bin	Tally	Frequency
30 - 40	𝍸 |	6
40 - 50		
50 - 60		
60 - 70		
70 - 80		
80 - 90		

3) Use the frequency table to draw a histogram to display the data. Label your axis and histogram.

Bin	Tally	Frequency
30 - 40	𝍸 |	6
40 - 50		
50 - 60		
60 - 70		
70 - 80		
80 - 90		

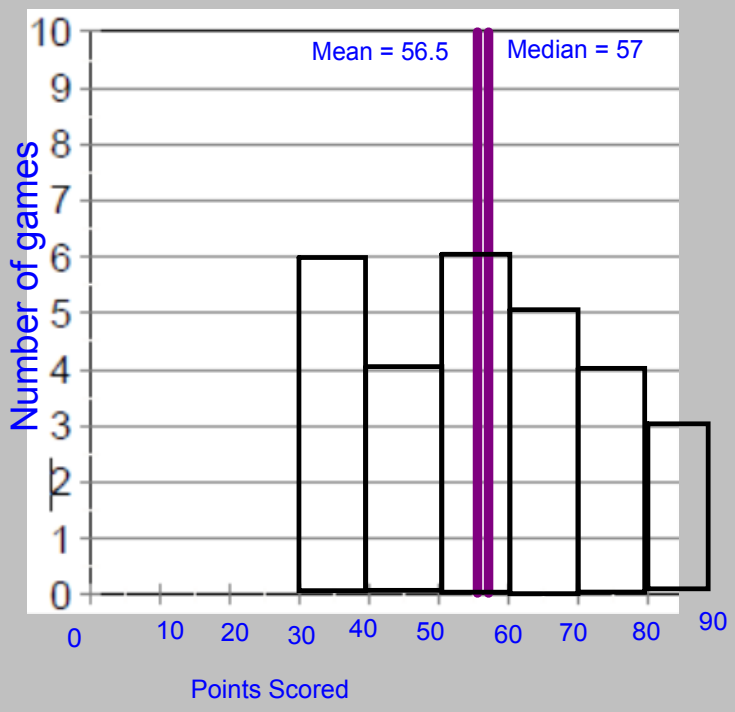


4) Mark a line for the median and mean.

3) Use the frequency table to draw a histogram to display the data. Label your axis and histogram.

Bin	Tally	Frequency
30 - 40	𝍸 I	6
40 - 50	IIII	4
50 - 60	𝍸 I	6
60 - 70	𝍸	5
70 - 80	IIII	4
80 - 90	III	3

4) Mark a line for the median and mean.

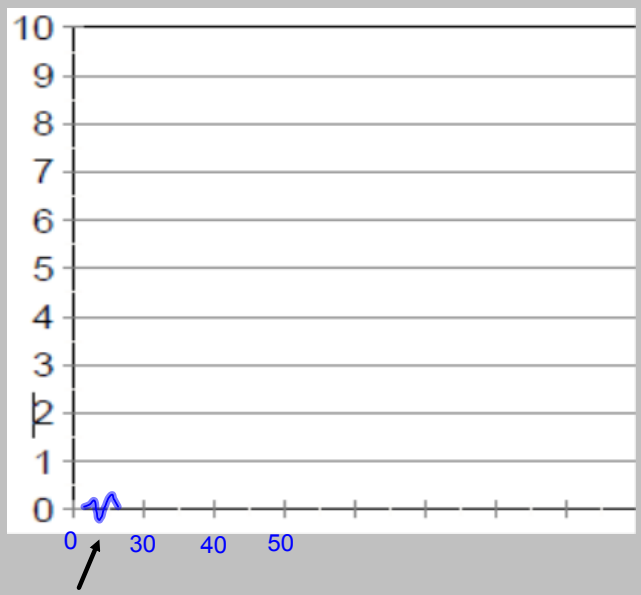


Practice: Ag. 20 #9-13

The marks for 18 students are listed below. Complete a frequency table using bin sizes of 10 and draw a histogram for the data. Label.

55 70 60
80 66 59
69 66 82
62 50 47
60 30 75
73 91 72

Bin	Tally	Frequency
30-40	I	I
40-50		
50-60		
60-70		
70-80		
80-90		
90-100		



Broken line, so that you can skip part of the scale

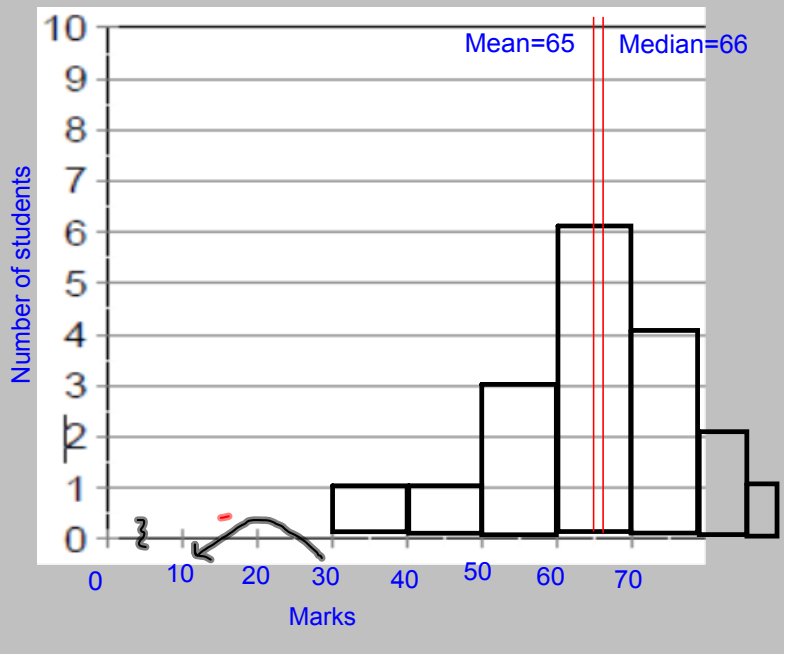
Practice:

The marks for 18 students are listed below. Complete a frequency table using bin sizes of 10 and draw a histogram for the data. Label.

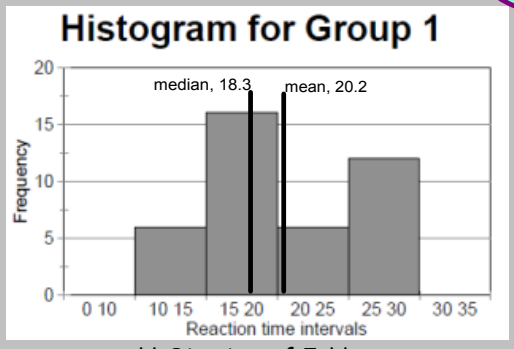
55 70 60
80 66 59
69 66 82
62 50 47
60 30 75
73 91 72

Written in order: 30,47,50,55,59,60,60,62,66,66,69,70,72,73,75,80,82,91

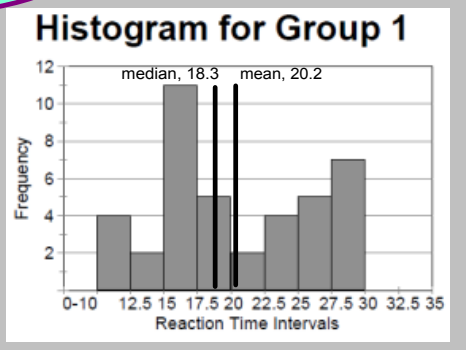
Bin	Tally	Frequency
30-40	I	1
40-50	I	1
50-60	III	3
60-70	IIII I	6
70-80	IIII	4
80-90	II	2
90-100	I	1



Focus Questions: P.23



** Bin size of 5 **



** Bin size of 2.5 **

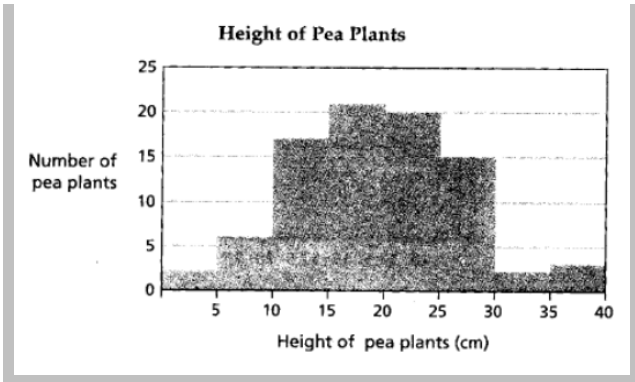
- Vertical lines show locations of the mean and median.

19. b) which bin size, 2.5 or 5, do you think gives a better picture of how the data are distributed? Explain.

The bin size of 2.5 gives us a better picture of how the data are distributed. The bin size of 5 shows us 2 clusters, while a bin size of 2.5 shows us 3 clusters (one very small one).

c) Predict what you think a histogram using a bin size of 10 will look like.

It would have only 2 bars, a 10 - 20 bar with a frequency of 22, and a 20-30 bar with a frequency of 18.



a) How many pea plants have heights from 5 - 10 cm?

b) How many pea plants have heights from 20 - 25 cm?

c) A 27 cm pea plant would be included in which bin?

d) A 15 cm pea plant would be included in which bin?

e) Which bin has the highest frequency? What is the frequency?

Warm-up #8

- Complete the following:
  Page 25: #26 (bin size 10)
  - -Create a Frequency table
  - -Create a Histogram
    - -Each axis labelled
    - -Mean and Median marked
  - -Answer question a

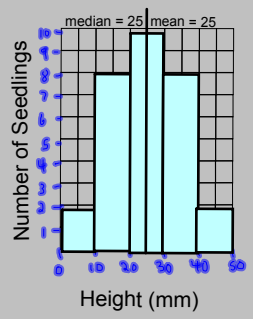
Warm-up #8

- Complete the following:
  Page 25: #26 (bin size 10)
  - -Create a Frequency table
  - -Create a Histogram
    - -Each axis labelled
    - -Mean and Median marked
  - -Answer question a

Numbers in order:

5, 7, 10, 10, 11, 13, 15, 16, 17, 18, 21, 22, 22, 24, 25, 25, 25, 26, 27, 29, 32, 33, 36, 36, 37, 37, 38, 39, 45, 48

Bin	Tally	Frequency
0 to 10	II	2
10 to 20	~~IIII~~ III	8
20 to 30	~~IIII~~ ~~IIII~~	10
30 to 40	~~IIII~~ III	8
40 to 50	II	2



median = (25 + 25) ÷ 2 = 25

mean (x̄) = 749/30 = 24.97 = 25

Answer to "a":
I do not consider any outliers, however the data value 5 and 48 could be considered.

Homework

Listed below are the numbers of Christmas trees sold at various locations on the same day.

17	27	19	20	21	31	23	23	24	25	27	44	27	25
27	17	28	29	22	32	35	33	34	32	36	36	41	26

Create a frequency table and a histogram for the data collected. Use a bin size of 10 and label your histogram.

Constructing a Histogram on the Calculator:

1. Complete the steps up to and including #8 on the constructing a box and whisker only instead of turning on the box and whisker press enter over the histogram picture under type in step #6.

**** If you are looking to use the same data, do not go through steps 1-5 and just begin below ****

2. To prepare a window: **You will have needed to have completed a frequency table.** Press WINDOW (in the blue keys). Here is what each of the items mean.

Xmin = smallest # on x axis (smallest number used in your first bin)
Xmax = largest # on x axis (largest number in your last bin)
Xscl = bin sizes (are your bins in 2's, 5's, 10's, what?)
Ymin = number before your smallest frequency
Ymax = Number after your largest frequency
Yscl = 1
Xres = 1

3. To see your graph: Press GRAPH (blue button)

4. To find answers on graph: Press TRACE (blue button) and move the cursor over each space to get the information. You will be able to find the bin size (Min = and Max <), and also the frequency for that bin (n=)

Enter these into your list

Practice:

Charlene shot the following scores playing golf over the summer:

83	85	95	91	72	90	90	86	93	91	95
97	101	95	99	86	95	90	91	85	90	

Complete the following questions using your TI-83 calculator and answer them on your own paper:

1. Make a frequency table.
2. Construct a histogram and sketch it in your book labeling each of the following: Xaxis (bins)
   Y-axis (frequencies)
   median and mean

Classwork:

Using the TI-83 graphic calculators complete the following:

- Make a histogram using the data found on page 53, question 8. Sketch the histogram. Label the median and mean.

- June collected the distances she drove each weekend for 30 weekends. The distances are listed below. Make a histogram with bin sizes of 20. Sketch the histogram.

31	8	93	69	75	2	33	194	83	17
2	207	99	32	8	2	75	126	30	9
211	93	8	75	198	25	32	71	9	98

Classwork:

Using the following data to create a box and whisker plot and a histogram plot (bin sizes of 15) using the TI-83 calculators. Sketch each plot separately. Make sure to label the mean and median on both.

Here are the scores students received from an assignment Mrs. Cote gave:

45 58 78 69 25 14 74 85 96 96 85 12 46 78

Assignment:

Complete the assignment labeled "Section 1.3 assignment":

* You will have the class to complete the assignment
* Show all of your work
* Use graph paper and rulers where necessary
* Re-check your answers